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(54) Title of the Invention      Lapping Device

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## Specifications

1. Title of the invention      Lapping device

### 2. Claims

A lapping device comprised of pressure plates eccentrically placed away from the lapping table; wafer sticker blocks between these pressure plates and the aforementioned lapping table on the side of the lapping table where wafers are affixed using pressure; ring shaped retainer rings supported on the inside by the aforementioned pressure plates and on the outside by the wafer sticker blocks; tube shaped driven gears formed on the outside top of these retainer rings and secured by bolts; a removable driver gear positioned apart from the aforementioned lapping table with a spacer so it cannot be engaged with the driven gears and that can be moved along the axle; and a bolt securing this driver gear and the aforementioned spacer to the aforementioned lapping table.

### 3. Detailed Description of this Invention

[Industrial Field of Application]

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This invention relates to a wafer lapping device.

[Existing Art]

Figure 5 is a plan view of an existing device and Figure 6 is a sectional view diagram of the line VI-VI. In the figures, (1) is the lapping table; (2) is the cylinder axle affixed from the top; (3) is the freely rotating pressure plate inserted into the bottom of the cylinder axle (2) with a bearing; (5) is the sticker block for sticking the wafer (4) positioned on top of the lapping table (1) inside of the ring shaped retainer ring (6) where a gear is formed on the outside. (7) is the lever secured to the pressure plate (3) and faces the stopper (8) secured to the top of the retainer ring (6). (9) is the driver gear secured by the bolt (10) in the center of the lapping table (1) and is engaged with the retainer ring (6). (11) is the grinder feeder secured from the top center of the lapping table (1).

Next is a description of the operation.

The wafer (4) secured to the wafer sticker block (5) on the lapping table (1) is subject to constant downwards pressure by the cylinder axle (2) via the freely rotating pressure plate (3).

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Rotating the lapping table (1) in the direction shown by the arrow A rotates the driver gear secured with the bolt (10) to the lapping table (1) in the same manner. The engaged retainer ring (6) rotates in the direction shown by the arrow B. Next, rotation of the retainer ring (6) is transmitted via the lever (7) facing the stopper (8) for the retainer ring (6) to the pressure plate (6) and sticker block (5). The grinder is lowered on the lapping table via four tubes from the grinder feeder (11). Rotation of the lapping table (1) and retainer ring (6) enables contact with the inside of the retainer ring via the bottom of the retainer ring (6). The grinder is moved to process the wafer (4) and simultaneously the weight of the retainer ring (6) adjusts the flatness of the lapping table (1). Abrasion causes the height of the bottom of the retainer ring (6) to be reduced, at which point it is replaced.

[Problems this Invention is to Solve]

Since existing lapping devices are constructed as given above, the disposable retainer ring (6)

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is subject to tremendous abrasion within the allowable height relative to the life of the external gears. As a result, the retainer ring must be replaced with a new part while the gears are still usable, which is not economical.

This invention is designed to solve the aforementioned problems and has the objective of providing a lapping device that economizes the disposable retainer ring.

[Means to Solve these Problems]

The lapping device relating to this invention involves a disposable retainer ring that separates the driven gear on the top from the ring-shaped retainer ring on the bottom, and is secured with bolts, making it possible to adjust the height of the driver gear with a spacer.

[Operation]

With the lapping device in this invention, when the retainer ring has reached the end of its abrasion life, the bolt securing the driven gear is removed and the retainer ring can be replaced.

[Embodiment Examples]

Next is a description of the embodiment example for this invention using Figures 1-4. In the figures, the retainer ring (60) and driven gear

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(60a) are tightened into a unit with bolts (60b) and the sticker blocks (5) with a wafer (4) attached are positioned on the lapping table (1) inside the retainer rings (60). The driver gear (9) at the center of the lapping table (1) is secured to the lapping table (1) with a bolt (10) tightened to the spacer (12).

Other marks are identical to those in an existing device and so are abbreviated.

Next is a description of the operation.

The wafer (4) secured to the wafer sticker block (5) on the lapping table (1) is subject to constant downwards pressure by the cylinder axle (2) via the freely rotating pressure plate. Rotating the lapping table (1) in the direction shown by the arrow A rotates the driver gear (9) secured with the spacer (12) to the lapping table (1) in the same manner. The engaged driven gear (60a) and the retainer ring (60) unitized with this driven gear (60a) rotate in the direction shown by the arrow B. Next, the rotation of the retainer ring (6) is transmitted via the lever (7) facing the stopper (8) secured to the driven gear (60a) to the pressure plate (3) and sticker block (5).

(5)

The grinder is lowered on the lapping table via four tubes from the grinder feeder (11). Rotation of the lapping table (1) and retainer ring (60) enables contact with the inside of the retainer ring (60) via the bottom of the retainer ring (60). The grinder is moved to process the wafer (4) and simultaneously the weight of the unitized retainer ring (60) and driven gear (60a) adjusts the flatness of the lapping table (1). The disposable bottom of the retainer ring (60) is subject to abrasion and since the height of the driven gear (60a) is reduced, it is possible to adjust the engaged height by moving the spacer up on the driver gear (9).

[Effect of this Invention]

As indicated above, this invention separates the driven gear from the disposable retainer ring, which has the effect of lowering the cost of the retainer ring.

#### 4. Brief Description of the Diagrams

Figure 1 is a sectional view diagram showing the embodiment example for this invention. Figure 2 is a plan view. Figure 3 is a side view of the important parts. Figure 4 is a plan view. Figure 5 is a plan view of an existing device.

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Figure 6 is a sectional view diagram of the line VI-VI.

In the figures, (1) is the lapping table; (3) denotes the pressure plates; (4) refers to the wafers; (5) indicates the sticker blocks; (60) denotes the retainer rings; (60a) refers to the driven gears; (9) is the driver gear; (10) is the bolt; and (12) refers to the spacer.

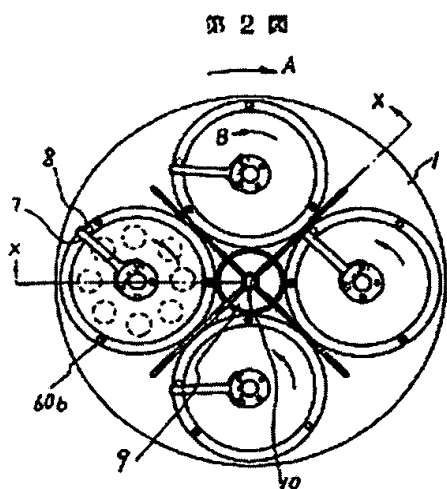
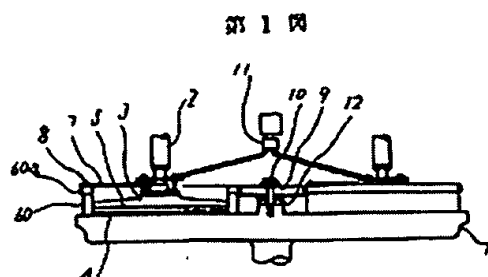
Symbols that are the same in each figure indicate identical or similar parts.

Patent Atty: Oiwa, Masuo



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Figure 1



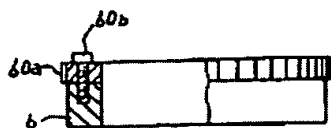
- 1: lapping table
- 2: cylinder axle
- 3: pressure plates
- 4: wafers
- 5: sticker blocks
- 60: retainer rings
- 60a: driven gears
- 60b: bolts
- 7: levers
- 8: stoppers
- 9: driver gear
- 10: bolt
- 11: grinder feeder
- 12: spacer

Figure 2

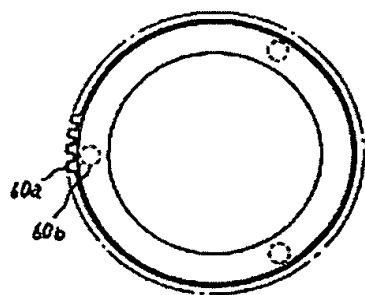
Patent Attorney: Masuo Oiwa

Figure 3  
Figure 4

第 3 図



第 4 図

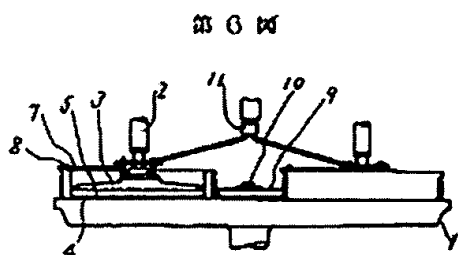
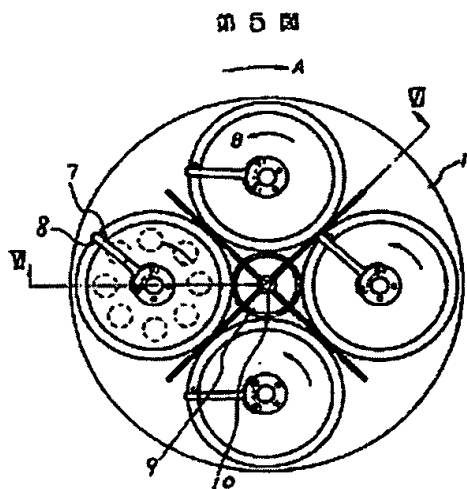


Patent Attorney: Masuo Oiwa

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Figure 5

Figure 6



Patent Attorney: Masuo Oiwa

Amendment of Proceedings (spontaneous)

November 15, 1985

To: Director-General of the Patent Office

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2. Title of the Invention: Lapping device
3. Person Filing Amendment:
  - Relationship to case: Utility model registration applicant
  - Address: (601) Mitsubishi Electric Corporation  
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Marunouchi, Chiyoda-ku, Tokyo
  - Name: (7375) Patent Attorney: Masuo Oiwa  
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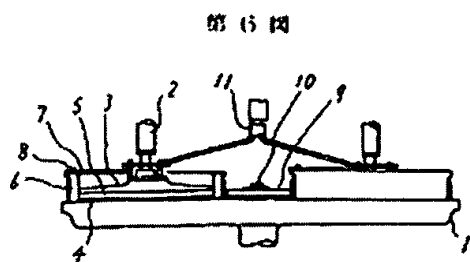
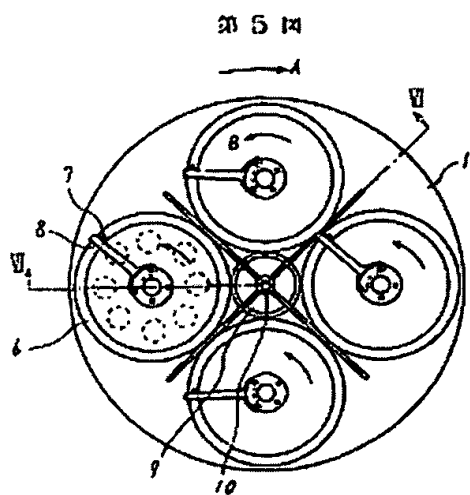
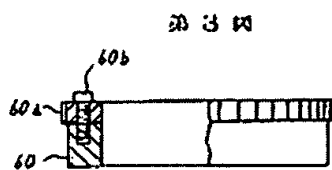
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- |                              |   |
|------------------------------|---|
| 5. Parts Amended:            | Detailed Description of this Invention<br>and Figures   |
| 6. Content of the Amendment: | (1) [note: incorporated into text]<br>(2) [note: incorporated into text]<br>(3) Figures 3, 5 and 6 are amended as<br>per the attachments. |

Figure 3

Figure 5

Figure 6



Patent Attorney: Masuo Oiwa

## ENGLISH ABSTRACT FOR JP 62-50047U

\*\* Result [U ] \*\* Format(P803) 2004.12.02 1/ 1

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 Applicant: MITSUBISHI ELECTRIC CORP  
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 Title of invention: Lapping apparatus  
 Abstract: [ABSTRACT]

The retainer ring which is consumables is split into a retainer ring of an upper driven gear and letter of ring of lower part, it is coupled in bolt, because elevation direction of driver was done if adjustable by spacer, it is possible to be cheap with the retainer ring which is consumables.  
 Additional word:A wafer

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 Trial and opposition intermediate record:

Registration intermediate record:

Amount of annuity payment:  
 Extinction of right/Lapse date of right: ( ) [ ]  
 Proprietor: -  
 Status of register: ( )